AMENDMENTS TO THE DRAWINGS

Please replace FIGS. 3a, 3b, 4a, 4b and 5 as originally filed with the replacement drawings FIGS. 3a, 3b, 4a, 4b and 5 attached hereto.

Attachment: Replacement Sheets (FIGS. 3a, 3b, 4a, 4b and 5)

REMARKS

Applicant's attorney previously filed a Power of Attorney, executed by the authorized representative of Lumenis Ltd., appointing Mintz Levin P.C. and its registered practitioners as the representative for service for the above-identified application. The examiner has sent applicant's previous representative for service (Pearl Cohen Zedek Latzer, LLP) a Notice Regarding Power of Attorney, dated March 17, 2008, indicating that the Power of Attorney filed with the previous response to Office Action was not acceptable because the certificate required by 37 CFR 3.73(b) has not been received.

Applicant has filed an assignment evidencing the transfer of the right and title in and to the above identified application from Lumenis Inc. (the original assignee for the above-identified application) to Lumenis Ltd. A copy of the assignment receipt from the USPTO is attached for the examiner's convenience. Applicant is also filing herewith another copy of the Power of Attorney from Lumenis Ltd. appointing Mintz Levin P.C. as its representative for service in relation to the above-identified application. Applicant requests that all communications regarding the above-identified application be forwarded to the address indicated below. If the examiner considers that the Power of Attorney appointing Mintz Levin P.C. as representative for service is still defective for one or more reasons, the examiner is asked to advise the undersigned attorney of any such defect so that applicant may take corrective action.

Turning now to the final office action, the examiner objected to FIGS. 3a, 3b, 4a, 4b and 5 on the ground that the contrast is too poor to distinguish separate elements discussed in the specification. In response, applicant submits replacement drawings FIGS. 3a, 3b, 4a, 4b and 5 with an improved contrast quality to enable distinguishing the separate elements referred to in the specification.

The examiner objected to the drawings under 37 CFR 1.83(a) on the ground that the drawings must show every feature of the invention specified in the claims, including the features "irrigating an area", an "irrigation mechanism", and "a second optical fiber".

Applicant respectfully disagrees with the examiner's contentions.

35 U.S.C. §113 provides "[t]he applicant shall furnish a drawing <u>where necessary</u> for the understanding of the subject matter to be patented" (emphasis added). Thus, it is only when necessary for understanding of the subject matter to be patented that it becomes mandatory to submit drawings.

In this case, the features of claims 48-51, each depending respectively from independent claims 1, 17, 26 and 35, are directed to irrigating the area to which the modified electromagnetic radiation is applied with an aqueous solution. As explained in the published application:

> **[0026] According to another embodiment of the present invention the targeted tissue is 208 irrigated with saline or any other solution and the output electromagnetic energy is applied onto the solution. The output end 214 of the GRIN fiber 212 may be in direct contact with the solution. The solution may be applied onto the target tissue 208 in accordance with any known or yet to be devised methods. (PG Patent Publication No. 2004/0199148, page 2, paragraph 26)**

Applicant submits that the subject matter of dependent claims 48-51 is readily understandable, and in any event is amply described in the written description of the application. Accordingly, applicant contends that under these circumstances, drawings are <u>not</u> necessary for the understanding of the subject matter of dependent claims 48-51. The examiner's objection to the drawing under 37 CFR 1.83(a) is thus traversed.

The examiner rejected claims 1, 2, 7-12, 15-17, 20-22, 24-27, 30, 33-38, 43 and 46-51 under U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,304,173 to Kittrell et al.

Also, the examiner rejected claims 1-3, 6-11, 15-18, 20, 21, 23-27, 30, 33-36, 38, 40, 41, 43, 46 and 47 under U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,835,647 to Fischer et al.

Additionally, the examiner rejected claims 5 and 39 under 35 U.S.C. §103(a) as being unpatentable over Fischer in combination with U.S. Patent No. 6,199,554 to Mann et al. The examiner also rejected claims 4, 19, 29 and 42 under 35 U.S.C. §103(a) as being unpatentable over Fischer in combination with U.S. Patent No. 5,951,543 to Brauer.

Applicant amended independent claim 1 to clarify that the optical fiber has a graded index core profile and a length that are each selected to modify the input electromagnetic radiation to a modified electromagnetic radiation having one of substantially Gaussian intensity distribution, a substantially bell curve shaped intensity distribution, a substantially parabolic intensity distribution and a substantially Lorentzian intensity distribution. Support for this clarification is provided throughout the application, including, for example, at paragraphs 18-19 on pages 1 and 2 and at paragraph 24 on page 2 of the published application (PG Patent Publication No. 2004/0199148).

Applicant's amended independent claim 1 thus recites "passing the electromagnetic radiation through a graded index optical fiber, the graded index optical fiber having a graded index core profile and a length selected to modify the electromagnetic radiation to a modified

electromagnetic radiation having an intensity distribution including one of a substantially Gaussian intensity distribution, a substantially bell curve shaped intensity distribution, a substantially parabolic intensity distribution and a substantially Lorentzian intensity distribution, the graded index optical fiber outputting the modified electromagnetic radiation; and applying the modified laser beam outputted by the graded index optical fiber to the human body". As explained in the published application:

> **[0018] The core's 102 index of refraction is typically highest at the center, and is radially reduced to, typically, substantially equal the refractive index of the clad 104 at the boundary. This difference in the refraction index between the core and the clad is partially responsible for the electromagnetic radiation transmission characteristics. In alternate embodiments, the index of refraction at the edge of the core 102 to be reduced to that substantially equal to that of the clad 104. Various graded index core profiles suitable for use with embodiments of the present invention may be designed and implemented including, but not limited to, a parabolic like profile, a pyramid like profile and others. In other embodiments, a non-step refractive index function may be used as a core profile.**
>
> **[0019] The graded index design of the core 102 causes the electromagnetic radiation entering the GRIN fiber 100 to be constantly refracted towards the center of the core. Due to the propagation characteristics of electromagnetic radiation along the GRIN fiber 100 the output radiation emitted from the GRIN fiber 100 may be modified such that the intensity distribution of the radiation is increased around the center when viewed cross-sectionally. For example, the output radiation may have an about Gaussian or Lorentzian intensity distribution, or more towards a Gaussian or Lorentzian distribution than that of the input beam. Other cross sectional distributions may be produced, such as a bell curve distribution, or a distribution more towards a bell curve than that of the input beam. The level of intensity of the radiation may depend upon, among other factors, the length of the GRIN fiber 100. A substantially Gaussian or Lorentzian intensity may be achieved provided that the length of the GRIN fiber 100 is above a certain threshold. In other embodiments, less than this threshold length may be used to move the intensity distribution towards the Gaussian or Lorentzian. The GRIN fiber 100 may be manufactured and designed using known methods. (PG Patent Publication No. 2004/0199148, pages 1-2, paragraphs 18-19)**

Thus, it is the selected graded core profile and the selected length for the optical fiber in applicant's claim 1 that cause the input electromagnetic radiation to be modified to one of a substantially Gaussian intensity distribution, a substantially bell curve shaped intensity distribution, a substantially parabolic intensity distribution and a substantially Lorentzian intensity distribution. The electromagnetic radiation so modified is then applied to the human body.

In contrast, none of the cited references relied upon by the examiner discloses or suggests at least the features of "passing the electromagnetic radiation through a graded index optical fiber, the graded index optical fiber having a graded index core profile and a length selected to modify the electromagnetic radiation to a modified electromagnetic radiation having

an intensity distribution including one of a substantially Gaussian intensity distribution, a substantially bell curve shaped intensity distribution, a substantially parabolic intensity distribution and a substantially Lorentzian intensity distribution, the graded index optical fiber outputting the modified electromagnetic radiation," as required by applicant's independent claim 1.

Specifically, and as described in applicant's Reply to Office Action of August 23, 2007, Kittrell describes optical fibers within a catheter that direct laser radiation for medical applications that include diagnosis and removal of arterial or vascular obstructions (Kittrell, col. 1, lines 16-20). Kittrell explains that in some embodiments the optical fiber may be a graded index optical fiber:

> **Alternate embodiments of optical fibers 20 include any light conduit. The optical fiber described previously has a core 22 which carries the optical radiation, a cladding 24 of lower index of refraction which confines the radiation, and a jacket or buffer 26 which protects and strengthens the optical fibers 20, FIG. 2. Alternate embodiments include optical fibers 20 without buffer 26, and without buffer 26 or cladding 24. (In the case of core only the surrounding air or gas functions as lower index cladding.) <u>Graded index optical fibers may also be used.</u> The core 22 need not be solid; a fluid filled tube may also be considered an optical fiber 20. A gas or air filled hollow waveguide tube may also be used, and may be made of metal, glass or plastic, with an optional reflective coating inside. Various numbers of optical fibers may be used. In the preferred embodiment, nineteen optical fibers 20 form a symmetric hexagonal close packing array as shown in FIG. 1A. This is likewise true for the seven optical fiber 20 configuration shown in FIG. 3. The sequence for larger numbers of optical fibers is thirty-seven, sixty-one, etc., to form, hexagonal close packing. The optical fibers need not all be the same size or type in a laser catheter. (Kittrell, emphasis added, col. 13, lines 1-23)**

While Kittrell disclosed that graded index optical fiber may be used, at no point does Kittrell describe that the graded index optical fiber used has a graded core profile and a length that are selected to modify the radiation to a modified radiation having a Gaussian, Bell-shaped curve, parabolic, Lorentzian, or other such intensity distributions. Indeed, Kittrell does not at all discuss using or modifying radiation so that the resultant radiation has an intensity distribution having a Gaussian, Bell-curve shape, parabolic and/or Lorentzian distribution.

The examiner contends in the May 22, 2008 Final Action that:

> The examiner firstly notes that the claims at bar recite "a graded index fiber having dimensions to modify the electromagnetic radiation to a modified electromagnetic radiation.. ." as set forth more clearly below, Kittrell et a1 teach a graded index fiber having the disclosed dimensions. Thus having the dimensions disclosed to produce the Gaussian output, as disclosed in the instant specification, the fiber of Kittrell et a1 must inherently produce the same Gaussian output. (Final Action, page 3)

Applicant respectfully disagrees. While graded optical fibers may be used to enhance transmission of radiation delivered by the fiber (as acknowledged in the application at, for example, at paragraph 4 of page 1 of the published application), there is no indication in Kittrell that the particular characteristics of the optical fiber, for example, the graded core profile and/or the length, are selected to achieve a particular output radiation distribution. There is certainly no mention anywhere in Kittrell that the characteristics of the optical fiber are selected to achieve a resultant radiation that has an intensity distribution having a Gaussian, Bell-curve shape, parabolic and/or Lorentzian shapes.

Accordingly, contrary to the Examiner's contentions, Kittrell fails to disclose or suggest at least the features of "passing the electromagnetic radiation through a graded index optical fiber, the graded index optical fiber having a graded index core profile and a length selected to modify the electromagnetic radiation to a modified electromagnetic radiation having an intensity distribution including one of a substantially Gaussian intensity distribution, a substantially bell curve shaped intensity distribution, a substantially parabolic intensity distribution and a substantially Lorentzian intensity distribution, the graded index optical fiber outputting the modified electromagnetic radiation," as required by applicant's independent claim 1.

Fischer describes a device for generating a laser beam having a homogenized cross section (Abstract). Particularly, Fischer's device includes a solid state laser and a transmission fiber 2 to carry the generated radiation of the laser. The transmission fiber is terminated in a broken surface 4 that is followed by an end piece 5 such as a quartz rod:

> **The radiation exiting therefrom enters a transmission fiber 2. This is a fiber having a length of at least 0.2 m and an external diameter of between 50 and 1000 µm. The transmission fiber 2 consists, for example, of ZrF_4 or of another material which is transparent to the wavelength emitted by the solid-state laser 1. This wavelength is between 2 and 3 µm in the stated substances.**
>
> **At the free end 3, the transmission fiber 2 terminate in a broken surface 4 and is followed at a spacing of between 0 and 20 mm by an end piece 5, for example, a quartz rod having a length of between 5 and 50 mm.**
>
> **The free end of the transmission fiber 2 and the end piece 5 are jointly held in a metal sleeve 6 by means of, for example, an adhesive 7.**
>
> **The end faces 8 of the end piece 5 are formed plane, for example, by polishing. They extend perpendicularly to the longitudinal axis of the end piece 5.**
>
> **The laser radiation generated by this device is emitted divergently and exhibits a rotationally symmetrical radiation distribution which is mode-homogenized. For example, the intensity distribution over the cross section, which is indicated by way of an example in the drawing, can be a Gaussian distribution, a super Gaussian, a parabolic or also a ring-shaped**

> **distribution. This depends, inter alia on the length of the transmission fiber, on the entrance angle into the transmission fiber and also on the flexure of the transmission fiber. (Fischer, col. 3, line 45 to col. 4, line 4)**

Thus, as is made clear by Fischer, a Gaussian distribution (or other forms of distributions) of the output radiation is generated by the resultant interaction of the fiber 2 with the end piece 5 of Fischer's device. Indeed, as shown in FIG. 1, the resultant Gaussian intensity distribution is formed at the end face 8 of the end piece 5. Fischer's transmission fiber does not by itself modify the radiation passing through it to a particular intensity distribution such as a Gaussian distribution. There is no indication anywhere in Fischer that the output radiation at the output end of the optical fiber has a Gaussian or some other type of distribution. Fischer certainly does not disclose that the optical fiber 2 has a graded core profile and/or length that are selected to cause radiation having a Gaussian distribution to be generated.

Accordingly, Fischer also fails to disclose or suggest at least the features of "passing the electromagnetic radiation through a graded index optical fiber, the graded index optical fiber having a graded index core profile and a length selected to modify the electromagnetic radiation to a modified electromagnetic radiation having an intensity distribution including one of a substantially Gaussian intensity distribution, a substantially bell curve shaped intensity distribution, a substantially parabolic intensity distribution and a substantially Lorentzian intensity distribution, and the graded index optical fiber outputting the modified electromagnetic radiation," as required by applicant's independent claim 1.

Because none of the cited references discloses or suggests, alone or in combination, at least the features of "passing the electromagnetic radiation through a graded index optical fiber, the graded index optical fiber having a graded index core profile and a length selected to modify the electromagnetic radiation to a modified electromagnetic radiation having an intensity distribution including one of a substantially Gaussian intensity distribution, a substantially bell curve shaped intensity distribution, a substantially parabolic intensity distribution and a substantially Lorentzian intensity distribution, the graded index optical fiber outputting the modified electromagnetic radiation," applicant's independent claim 1, and the claims depending from it, are therefore patentable over the cited prior art references.

Applicant's independent claims 17, 26 and 35 recite "passing the laser beam through an optical fiber, the optical fiber having a graded index core profile and a length selected to modify the laser beam to a modified laser beam having an intensity distribution corresponding substantially to a Gaussian intensity distribution," or similar language. For reasons similar to

those provided with respect to independent claim 1, at least these features are not disclosed by the cited prior art references. Applicant's independent claims 17, 26 and 35, and the respective claims depending from them, are therefore patentable over the cited art.

CONCLUSION

It is believed that all of the pending claims have been addressed in this paper. However, failure to address a specific rejection, issue or comment, does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above are not intended to be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

On the basis of the foregoing amendments, applicant respectfully submits that the pending claims are in condition for allowance. If there are any questions regarding these amendments and remarks, the examiner is encouraged to contact the undersigned at the telephone number provided below.

The Commissioner is hereby authorized to charge any fees that may be due, or credit any overpayment of same, to Deposit Account No. 50-0311, Reference No. 35678-604C01US.

Respectfully submitted,

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